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# THE STRATEGIC LEVEL OF INNOVATION POLICY - A SYSTEMS-EVOLUTIONARY PERSPECTIVE (Abstract)

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Abstract

***Motivation***

A recent World Bank review of economic reforms in industrializing economies during the 1990s candidly concludes that, with some exceptions, these economies failed to promote economic growth (World Bank 2005). In turn, UNCTAD 2008 (p. 57) suggests that the reason lies in that "more knowledge about the factors contributing to economic growth is required", economic reforms of the Washington Consensus genre being not enough and a 'proactive', policy-driven catch up process being required, at least regarding the Least Developed Countries.

The above are among a variety of statements of late suggesting that the policy and growth promoting approaches enshrined by the Washington Consensus are insufficient or inappropriate, one reason being their almost exclusive emphases on "economic reforms" (largely independent of context and structure), based on a constrained and static view of what are the relevant institutions and how these, along with policies, influence economic growth. Moreover, based on theoretical arguments or simply 'ideology', though direct incentives to innovation are in principle accepted as necessary, there is a strong preference for tax incentives over direct subsidization. Underlying this, there is a seemingly *ingrained* view that 'subsidies to innovation' have failed, which is not supported by serious empirical research -- there being clear successful cases such as those of Israel between 1969 and 1992 and Chile starting in the mid-1990s. As to the impact of tax concessions on innovation, various authors show that their effects have been ambiguous at best, with a strong presumption that subsidization would have been more effective.

Among other problems with the prevailing view of the record of industrializing economies (e.g. unduly strong focus on R&D-based innovation and much less on a broader Schumpeterian notion of innovation which arguably would be even more relevant), there is also an enhanced awareness of the shortcomings of the prevailing justification for innovation policy, that is, *market failure in private sector R&D.* In fact, such failure may originate in other functions, some of them 'technological' such as design and engineering; others related to management, marketing, market penetration, etc. Last but not least, a major point of divergence between the 'Old' and the emerging or 'New' view on policy underpinnings is the notion of *system failures*, that is, that innovation is blocked not because of lack of incentives to business firms but because the innovation system either does not exist or has big gaps in business sector support structures (including both, the 'classical' science, technology and education infrastructure and others, especially those geared to SMEs).

The need for a new systems-evolutionary framework for innovation policy also pertains to advanced countries. The 'evolutionary policy maker' is an *adaptive policy maker* rather than the optimizing policy maker found in neoclassical economic theory (various papers by Metcalfe). This stems from a view that there is *radical uncertainty about the* future i.e. not all uncertainty confronting policy makers being reducible to risk. This view, which links with Schumpeter's *Indeterminacy of History*, is much more cogent in its policy implications than *bounded rationality.*

The presence of radical uncertainty has important implications for the policy process -- along with the highly dynamic environment that underpins it (stemming from the constant stream of new technologies and from the spur of global competition). First, underlying successful innovation policy, we are increasingly likely to find nowadays new, knowledge intensive, policy processes, that is, those entailing a prior process of setting strategic priorities and policy *objectives*. Second, in a world were the

global and often the domestic contexts undergo radical changes, the likelihood that the existing national policy portfolio fits the current and future needs of the relevant country or region (be it advanced or developing), is bound to be rather low. It follows that, *ascertaining a new set of strategic priorities in science, technology, higher education and innovation* becomes a major and primordial aspect of the policy process. Such critical review of policy fundamentals will have to precede the gradual building up of a new policy portfolio, which reflects the new global and domestic situation and trends.

The above views shape the intellectual underpinnings of *a higher level of innovation policy* which we term the *Strategic Level* (Avnimelch and Teubal 2008, Sercovich and Teubal 2008), to be sharply differentiated with respect to the existing policy set up of most countries -- focused on what may be called the *Operation Level of Policy*. Its major task consists of *identifying new Strategic Priorities and contributing to their articulation in terms of new policies.*

***Ojectives***
The paper will:

*i.* *Submit an overall perspective of an integrated systems-evolutionary perspective to innovation and technology policy (broadly defined) and a synthesis of the differences between the 'Old' and the 'New' approaches to innovation policy.*

*ii.* *Put forward a 'strategic' level of policy and assess its institutional, governance and capabilities underpinnings*

*iii.* *Provide illustrations of 'strategic policy-making' and its links with the operational level of policy (taken from among the experiences of Taiwan and Republic of Korea, Latin American countries, Scandinavian countries and Israel)*

Objective i will involve extending and adapting previous work on the Systems-Evolutionary perspective to Innovation Policy (Avnimelech and Teubal op. cit). The differences between "old" and 'new'/ Systems/Evolutionary perspectives refer to: the justification of policies; to their Focus and Objectives; to the nature of Incentives and Incentives' Programs; to the overall Approach to policy making; and to the existence or not of a Strategic Level of Policy. In this abstract we further specify the last aspect

***Notes on the Strategic Level of Policy***[1]
This is a central difference between the the Old and New approaches to Innovation Policy broadly defined. The need for a strategic level of policy derives from the radical changes in the global environment (both actual and expected in the future) including its enhanced complexity, dynamism and turbulence; from the enhanced need for policy targeting; and from the enhanced needs for policy coordination in order to assure coherence and dynamic efficiency of the new policy portfolio aimed at.

The basic function of the strategic level is to identify and specify strategic priorities, which to a large extent, should precede the actual design of new policies. Another important function is to contribute, jointly with the operacional level of policy, to the translation or articulation of these priorities in terms of new incentives programs and institutional changes (this would require identification of the relevant market and system failures blocking the attainment of these priorities in the context of the existing innovation and policy system including the set of policies already in operation). In both of these functions a broad, systems evolutionary perspective should be undertaken e.g. a greater integration of policies towards the STE infrstructure with policies directly supporting Commercial Innovation in the business sector (including, whenever relevant, with venture capital and other high tech directed policies concerning the future evolution of a country's high tech cluster)

[1] Throughout we will be assuming that an operational level of STE & CI policy already exists in the relevant country

The strategic level should function continuously by undertaking *search, research and discovery activities* in a systematic way, while attempting to build up the relevant capabilities (note that these differ substantially from the capabilities required to implement existing policies that is with operacional policy capabilities). It should deal not only in *product but also in process* that is not only what the new priorities and policies should be but also what process or processes should be introduced (including the policy processes mentioned above) in order to effectively identify and specify these new conceptual entitities i.e Strategic Priorities.

*A main underpinning of the strategic level is to develop a future integrated vision of the economy and society; and of the profiles of innovation based growth that might lead to the materialization of this vision (this would then translate into the set of priorities mentioned above).*

*A Strategic Policy Institution*

A *Strategic Science, Technology and and Higher Education (STE) & Commercial Innovation (CI)Policy Forum* should permit *a permanent activity* at the strategic level of policy. It is critical to attain an adequate 'positioning' of this institution in the overall STE & CI governance structure of the country. Thus is some cases attempts are made to reduce the traditional dependence of the above type of policy institution with the country's Ministry of Finance (MOF) in order to better reflect the enhanced knowledge creation and supraministerial coordination function rather than specific lower level (and even specific Agency related) budgeting decisions. In some countries like in Korea attempts have been made to link such a type of policy institution to the PM or President rather than to a specific Ministry like the Ministry of Sciene and Technology. In LDC it is imperative to link strongly this type of policy institution with the agency in charge of defining the overall economic & social development strategy of the country. Again and depending on case, this may also involve a somewhat reduce dependence to specific ministries and to the Ministry of Finance; and enhanced direct dependence on the Government (or PM or President) itself.

Another point is the link between the strategic policy forum and the operational, policy execution agencies. Links there should be since operational experience and developments in the field should be central to the identification of new strategic priorities and their translation into new programs/policies. But the strategic policy forum should be independent of the operational agencies in charge of promoting CI in its capacity to propose new priorities and programs as well as in the evaluation of past policies (frequently being done by the operational units themselves).

The **central functions** of the new strategic forum or agency are

(1) *Identify and Specify Strategic Priorities in the STE and CI areas; and the Market and System Failures which, given existing policies and the existing national innovation system, block their attainment within the relevant time period*
(2) *Jointly with operational STE & CI policy agencies, contribute to the translation of the above priorities into new programs, institutional changes and other policy actions*
(3) *Characterize the existing overall policy portfolio of the country and the 'desirable' portfolio aimed at within the next 5-10 years*
(4) *In some cases, play a central, professional role in the determination of a national, integrated STE & CI policy budget for the country*
(5) *Play an important 'coordinating' role among the various Ministries and Agencies involved in STE & CI policy*

Function (1) is the **main function** and it is linked very closely to the capacity of strategic forum to *frame policies***.** Explicit priority setting and undertaking this within an integrated STE & CI framework is relatively new both in advanced and certainly in Developing Countries: most priorities in the past were implicit rather than explicit and if explicit, not sufficiently specified. Therefore, during its first years the strategic policy forum should undergoe a strong process of learning and building up of capabilities and networks. Depending on the overall capabilities of the specific country considered, the strategic policy forum should be involved in identifying required resources & capabilities, selective employment of high calliber professionals, learning by doing, benchmarking relevant mechanisms and methodologies used in priority setting, etc. For this and for other functions, it is important that the new agency develop close working relationships with the operational policy agencies and with the other relevant actors in the STE & CI policy scene e.g depending on country Ministry of Science and

Technology, Ministry of Trade and Industry, Ministry of Agriculture, Industry Associations, MOF etc. This should also include new knowledge/skill intensive mechanisms of interaction and collaboration e.g. joint brainstorming sessions, joint research teams, etc.[2]

Undertaking a continued and systematic process of identifying STE & CI strategic priorities is of enormous importance. The process inherently involves incomplete information and *muddling through*; and in some cases, generating additional information necessitates implementation of some policies, possibly on an experimental basis ("doing")[3]. The actual methodologies for identification of an explicit set of *Strategic Priorities* will require significant additional work of a small number of appropriately selected and integrated teams[4]. Each team would start with the accumulated knowledge embedded within its members and from the lines of action and knowledge reported below. Additional information and knowledge resulting from brainstorming, interviews, search-research-discovery, analysis and benchmarking will lead to further specification both of the priorities and of the policies and other related action items reported here. These 'intermediate' results would then be the subject of a subsequent round of analysis and brainstorming, and so on. Needless to say that beyond specific knowledge about the particular country, successful setting of such priorities requires a critical mass of knowledge about priorities and policies implemented in different contexts and countries; about how to classify such information, and what is its meaning given the actual and expected domestic and global contexts.

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[2] These considerations suggest that relying on the creation of Ministers of Science and Technology in LDCs as central policy agents/institutions may be seriously misleading (UNCTAD 2007)

[3] For example the experimental implementation of new policies may reveal hitherto unknown constraints blocking innovation in a particular area and, under certain circumstances, may radically change policy makers perspective about policy objectives (rather than only changing the details of policy design or implementation).

[4] Needless to say these methodologies will very likely differen radically from the well known 'planning' mechanisms of decades ago which reflected a completely different environment and set of conditions.